Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII (NEW) EXAMINATION – WINTER 2023

Subject Code:3171113 Date:16-12-2023

Subject Name:Practical aspects of Computer Vision

Time:10:30 AM TO 01:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			Marks
Q.1	**(a)**	Explain K-Nearest Neighbors method for classification and segmentation.	**03**
	(b)	Explain Segmentation using Clustering.	**04**
	(c)	Explain how to searching the Database for Images.	**07**
Q.2	**(a)**	Explain about Indexing images in brief.	**03**
	(b)	Explain techniques for matching Geotagged Images	**04**
	(c)	Write a short note on epipolar geometry in detail.	**07**
		OR	
	(c)	Explain image registration process in detail.	**07**
Q.3	**(a)**	Explain Spatial domain operations for Image processing.	**03**
	(b)	Explain Image to Image Mapping.	**04**
	(c)	Explain Harris Corner Detector algorithm.	**07**
		OR	
Q.3	**(a)**	Explain Frequency domain operations for Image processing.	**03**
	(b)	Explain 3D reconstruction in brief.	**04**
	(c)	Explain SIFT - Scale-Invariant Feature Transform. In detail.	**07**
Q.4	**(a)**	How to Creating Panoramas to describe local images.	**03**
	(b)	Explain below terms in the context of transformations in 2D. (i) Translation (ii) Rotation	**04**
	(c)	Write a short note on homography & also explain direct linear transformation algorithm.	**07**
		OR	
Q.4	**(a)**	Write a note on RANSAC.	**03**
	(b)	Explain below terms in the context of transformations in 2D. (i) Scaling (ii) Shearing	**04**
	(c)	Write a note on Optical character recognition.	**07**
Q.5	**(a)**	Explain K-means Clustering in brief.	**03**
	(b)	Explain below terms in the context of transformations in 3D. (i) Translation (ii) Rotation about arbitrary axis	**04**
	(c)	What is the significance of Principal Component Analysis (PCA)?explain in detail.	**07**
		OR	
Q.5	**(a)**	Explain Camera Calibration.	**03**
	(b)	Explain geometry of perspective projection through pinhole camera.	**04**
	(c)	Explain Composition of transformations in 2D and 3D with anyone example.	**07**